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ALLATOONA RESERVOIR BARTOW, CHEROKEE, AND COBB COUNTIES GEORGIA

Pacific Northwest Environmental Research Laboratory

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16. ABSTRACT

Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivided according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
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REPORT
ON
ALLATOONA RESERVOIR
BARTOW, CHEROKEE, AND COBB COUNTIES
GEORGIA

EPA REGION IV

WORKING PAPER No. 281

WITH THE COOPERATION OF THE

GEORGIA DEPARTMENT OF NATURAL RESOURCES

AND THE

GEORGIA NATIONAL GUARD

JUNE, 1975

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FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to fresh water lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's fresh water lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGMENT

The staff of the National Eutrophication Survey (Office of Research & Development, U. S. Environmental Protection Agency) expresses sincere appreciation to the Georgia Department of Natural Resources for professional involvement and to the Georgia National Guard for conducting the tributary sampling phase of the Survey.

Joe D. Tanner, Commissioner of the Department of Natural Resources; J. Leonard Ledbetter, Director of the Environmental Protection Division; Ralph S. Howard, Jr., Environmental Affairs Coordinator; Gene B. Welsh, Chief of the Water Protection Branch; Edward T. Hall, Jr., Unit Coordinator; and Broughton A. Caldwell, R. Marshall Gaddis, William D. Kennedy, and Kenneth W. Martin, Environmental Specialists, provided invaluable lake documentation and counsel during the Survey, reviewed the preliminary lake reports, and provided critiques most useful in the preparation of this Working Paper series.

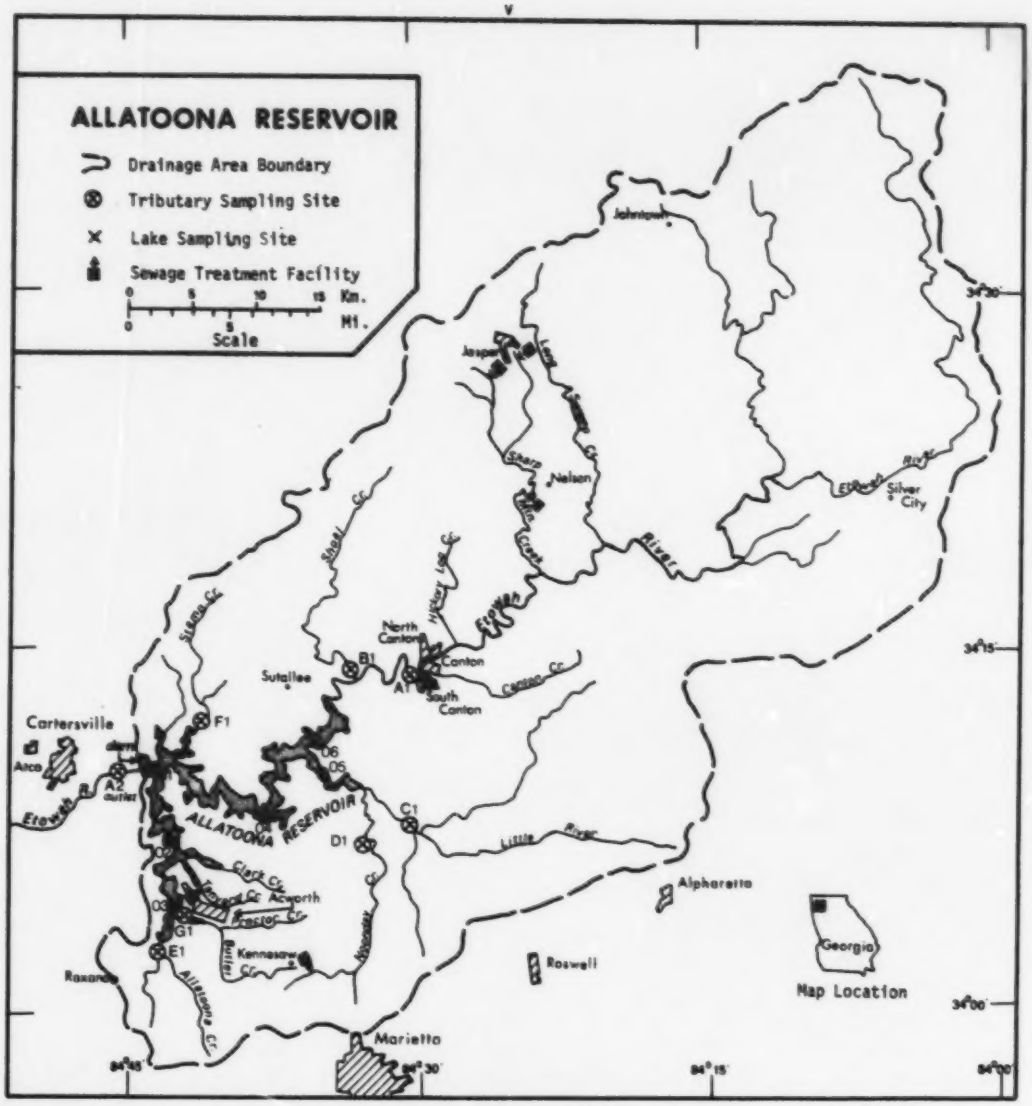
Major General Joel B. Paris, III, then the Adjutant General of Georgia, and Project Officer Lt. Colonel John R. Ranier, who directed the volunteer efforts of the Georgia National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

STUDY LAKES

STATE OF GEORGIA

LAKE NAME	COUNTY
Allatoona	Bartow, Cherokee, Cobb
Blackshear	Crisp, Dooly, Lee, Sumpter, Worth
Blue Ridge	Fannin
Burton	Rabun
Chatuge	Towns, GA; Clay, NC
Clark Hill	Columbia, Elbert, Lincoln, McDuffie, MWilks, GA; Abbeville, McCormick, SC
Harding	Harris, GA; Chambers, Lee, AL
Hartwell	Franklin, Hart, Stephens, GA; Anderson, Oconee, Pickens, SC
High Falls	Butts, Lamar, Monroe
Jackson	Butts, Jasper, Newton
Nottely	Union
Seminole	Decatur, Seminole, GA; Jackson, FL
Sidney Lanier	Dawson, Forsyth, Gwinnett, Hall, Lumpkin
Sinclair	Baldwin, Hancock, Putnam
Walter F. George	Clay, Quitman, Stewart, GA; Barbour, Henry, Russell, AL


ALLATOONA RESERVOIR
Drainage Area Boundary
Tributary Sampling Site
Lake Sampling Site
Sewage Treatment Facility
0 5 10 15 Km.
0 5 Mi.
Scale
Jasper
Nelson
Silver City
Canton
North Canton
South Canton
Sutallee
Cartersville
Acworth
Kennesaw
Roswell
Alpharetta
Marietta
Georgia
Map Location
Little River
Allatoona Creek
Noonday Creek
Clark Creek
Proctor Creek
Stamp Creek
Hickory Log Creek
Etowah River
ALLATOONA RESERVOIR
A1
A2 Outlet
B1
C1
D1
E1
F1
G1
O2
O3
O5
O6
34°30'
34°15'
34°00'
84°45'
84°30'
84°15'
84°00'

ALLATOONA RESERVOIR*

STORET NO. 1301

I. CONCLUSIONS

A. Trophic Condition:

Survey data indicate that Allatoona Reservoir is eutrophic. Allatoona Reservoir ranked seventh in overall trophic quality when the 14 Georgia lakes sampled in 1973 were compared using a combination of six lake parameters**. Five of the lakes had less median total phosphorus, four had less and two had the same dissolved phosphorus, five had less and one had the same median inorganic nitrogen, nine had less median chlorophyll a, and seven had greater Secchi disc transparency. Depression of dissolved oxygen with depth occurred at all sampling stations in July and at all but station 3 in September. In November, after the reservoir had destratified, dissolved oxygen in the shallowest samples ranged from 75% of saturation at station 1 (7.2 mg/l) to 94% of saturation at station 3 (10.0 mg/l).

Survey limnologists did not observe any nuisance conditions during the lake sampling.

B. Rate-Limiting Nutrient:

The algal assay results indicate phosphorus limitation at the time the samples were taken (06/30-07/01/73). The lake

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* Table of metric conversions--Appendix A.
** See Appendix B.

data indicate phosphorus limitation at the other sampling times as well.

C. Nutrient Controllability:

1. Point sources--During the sampling year, Allatoona Reservoir received a total phosphorus load at a rate of 2.07 $g/m^2/yr$. This rate is nearly twice that proposed by Vollenweider (Vollenweider and Dillon, 1974) as a eutrophic rate (see page 18). Of that load, at least 26.8% was from point sources.

Of the 27 known domestic wastewater treatment plants, the largest contributors were Canton (5.2%), Kennesaw (6.8%), and Acworth (5.0%). The phosphorus contributions of four industries impacting the reservoir are not known but are included in the "non-point" loads. Depending on the nutrient content of the industrial wastes, the point-source phosphorus input could be much higher than that indicated.

While even complete removal of phosphorus at the listed domestic point sources would still leave a loading rate of 1.52 $g/m^2/yr$, or 0.40 $g/m^2/yr$ in excess of the eutrophic rate, it is likely that a high degree of point-source phosphorus control would result in an improved trophic condition of Allatoona Reservoir, particularly if the unknown industrial loads constitute a significant portion of the total point-source load.

2. Non-point sources--It is calculated that non-point sources, including precipitation and the unknown industrial contributions, accounted for just over 73% of the total phosphorus load to the reservoir during the sampling year.

Generally, the phosphorus export rates of the reservoir tributaries (see page 17) are comparable to rates of other Georgia streams sampled; e.g., four unimpacted tributaries of Lake Sidney Lanier* had a mean export rate of 30 $kg/km^2/yr$ (range of 26 to 36 $kg/km^2/yr$).

* Working Paper No. 293.

II. LAKE AND DRAINAGE BASIN CHARACTERISTICS

A. Lake Morphometry†:

1. Surface area: 48.00 kilometers^2.
2. Mean depth: 9.4 meters.
3. Maximum depth: 45.1 meters.
4. Volume: 451.200 x 10^6 m^3.
5. Mean hydraulic retention time: 103 days.

B. Tributary and Outlet:
(See Appendix C for flow data)

1. Tributaries -

Name	Drainage area (km^2)*	Mean flow (m^3/sec)*
Etowah River	1,675.7	34.6
Shoal Creek	173.5	2.6
Little River	354.8	5.0
Noonday Creek	126.9	1.8
Allatoona Creek	72.5	1.0
Stamp Creek	46.6	0.7
Lake Acworth outlet	49.2	0.7
Minor tributaries & immediate drainage -	297.8	4.2
Totals	2,797.0	50.6

2. Outlet -

Etowah River	2,845.0**	50.6

C. Precipitation***:

1. Year of sampling: 144.2 centimeters.
2. Mean annual: 124.7 centimeters.

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† Hall, 1974.
* For limits of accuracy, see Working Paper No. 175, "...Survey Methods, 1973-1976".
** Total area adjusted to equal sum of subdrainage areas plus area of the lake.
*** See Working Paper No. 175.

III. LAKE WATER QUALITY SUMMARY

Allatoona Reservoir was sampled three times during the open-water season of 1973 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from six stations on the lake and from a number of depths at each station (see map, page v). During each visit, a single depth-integrated (4.6 m or near bottom to surface) sample was composited from the six stations for phytoplankton identification and enumeration; and during the first visit, two 18.9-liter depth-integrated samples were composited for algal assays (stations 1, 2, and 3 were combined, and stations 4, 5, and 6 were combined). Also each time, a depth-integrated sample was collected from each of the stations for chlorophyll *a* analysis. The maximum depths sampled were 39.9 meters at station 1, 16.8 meters at station 2, 4.6 meters at station 3, 13.1 meters at station 4, 7.3 meters at station 5, and 11.6 meters at station 6.

The lake sampling results are presented in full in Appendix D and are summarized in the following table.

A. SUMMARY OF PHYSICAL AND CHEMICAL CHARACTERISTICS FOR ALLATOONA RESERVOIR
STORET CODE 1301

PARAMETER	1ST SAMPLING (7/ 1/73) 6 SITES RANGE	MEAN	MEDIAN	2ND SAMPLING (9/17/73) 6 SITES RANGE	MEAN	MEDIAN	3RD SAMPLING (11/12/73) 6 SITES RANGE	MEAN	MEDIAN
TEMP (C)	20.2 - 29.1	25.3	24.6	21.4 - 27.1	25.1	25.2	9.6 - 16.7	14.3	15.2
DISS OXY (MG/L)	0.5 - 8.6	4.8	4.9	0.0 - 8.0	3.6	4.0	6.2 - 10.0	8.2	8.2
CNDCTVY (MCROMO)	50. - 63.	51.	50.	32. - 82.	45.	42.	26. - 45.	35.	34.
PH (STAND UNITS)	5.7 - 8.7	7.0	6.8	6.1 - 7.4	6.5	6.4	6.5 - 7.0	6.7	6.7
TOT ALK (MG/L)	11. - 27.	16.	15.	10. - 21.	17.	17.	16. - 30.	20.	19.
TOT P (MG/L)	0.012 - 0.084	0.024	0.020	0.008 - 0.096	0.024	0.014	0.018 - 0.090	0.030	0.026
ORTHO P (MG/L)	0.002 - 0.006	0.003	0.003	0.003 - 0.012	0.006	0.005	0.002 - 0.018	0.010	0.011
NO2+NO3 (MG/L)	0.050 - 0.340	0.121	0.100	0.020 - 0.270	0.064	0.030	0.040 - 0.340	0.082	0.060
AMMONIA (MG/L)	0.050 - 0.240	0.102	0.085	0.040 - 0.840	0.138	0.080	0.040 - 0.120	0.074	0.080
KJEL N (MG/L)	0.200 - 1.100	0.400	0.300	0.200 - 1.400	0.759	0.800	0.200 - 0.500	0.254	0.200
INORG N (MG/L)	0.110 - 0.540	0.223	0.205	0.060 - 0.860	0.201	0.120	0.090 - 0.430	0.156	0.140
TOTAL N (MG/L)	0.250 - 1.190	0.521	0.425	0.240 - 1.440	0.823	0.820	0.240 - 0.640	0.336	0.275
CHLRPYL A (UG/L)	4.0 - 11.2	6.7	5.4	4.6 - 13.5	8.4	8.0	2.9 - 20.8	7.3	5.1
SECCHI (METERS)	1.4 - 2.0	1.7	1.7	1.1 - 2.1	1.6	1.6	0.9 - 1.2	1.1	1.2

B. Biological characteristics:

1. Phytoplankton -

Sampling Date	Dominant Genera	Algal units per ml
06/30/73	1. Anabaena	953
	2. Melosira	318
	3. Peridinium	136
	4. Scenedesmus	136
	5. Merismopedia	136
	Other genera	411
	Total	2,090
09/17/73	1. Raphidiopsis	7,411
	2. Lyngbya	5,188
	3. Achnanthes	889
	4. Merismopedia	519
	5. Cryptomonas	445
	Other genera	3,408
	Total	17,860
11/12/73	1. Melosira	1,433
	2. Flagellates	302
	3. Synedra	264
	4. Cryptomonas	189
	5. Centric diatoms	189
	Other genera	489
	Total	2,866

2. Chlorophyll *a* -

Sampling Date	Station Number	Chlorophyll *a* (µg/l)
06/30 -07/01/73	01	4.6
	02	11.2
	03	6.1
	04	9.9
	05	4.0
	06	4.7
09/17/73	01	4.6
	02	6.3
	03	10.1
	04	6.7
	05	13.5
	06	9.3
11/12/73	01	3.8
	02	6.5
	03	6.4
	04	20.8
	05	3.4
	06	2.9

C. Limiting Nutrient Study:

1. Stations 1, 2, and 3 (June 30, 1973) -

a. Autoclaved, filtered, and nutrient spiked -

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.006	0.114	0.1
0.010 P	0.016	0.114	0.8
0.020 P	0.026	0.114	2.8
0.050 P	0.056	0.114	3.5
0.025 P + 0.5 N	0.031	0.614	8.4
0.050 P + 1.0 N	0.056	1.114	19.0
1.0 N	0.006	1.114	0.1

b. Filtered and nutrient spiked -

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.003	0.108	0.1
0.010 P	0.013	0.108	1.3
0.020 P	0.023	0.108	2.8
0.050 P	0.053	0.108	3.0
0.025 P + 0.5 N	0.028	0.608	10.0
0.050 P + 1.0 N	0.053	1.108	21.5
1.0 N	0.003	1.108	0.1

2. Stations 4, 5, and 6 (July 1, 1973) -

a. Autoclaved, filtered, and nutrient spiked -

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.015	0.180	0.2
0.010 P	0.025	0.180	4.1
0.020 P	0.035	0.180	6.7
0.050 P	0.065	0.180	8.2
0.025 P + 0.5 N	0.040	0.680	9.1
0.050 P + 1.0 N	0.065	1.180	16.6
1.0 N	0.015	1.180	0.2

b. Filtered and nutrient spiked -

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.014	0.220	0.1
0.010 P	0.024	0.220	2.7
0.020 P	0.034	0.220	5.3
0.050 P	0.064	0.220	6.2
0.025 P + 0.5 N	0.039	0.720	10.0
0.050 P + 1.0 N	0.064	1.220	18.1
1.0 N	0.014	1.220	0.1

3. Discussion -

The control yields of the assay alga, Selenastrum capricornutum, indicate that the potential primary productivity

of Allatoona Reservoir was low at the time the sample was collected. Also, the increased yields with increased orthophosphorus and the lack of yield response when only nitrogen was added indicate that phosphorus was limiting at the time the sample was collected.

The lake chemistry data also indicate phosphorus limitation; i.e., the mean inorganic nitrogen to orthophosphorus ratios were 16 to 1 or greater at all sampling times.

IV. NUTRIENT LOADINGS
(See Appendix E for data)

For the determination of nutrient loadings, the Georgia National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page v), except for the high runoff months of January and February when two samples were collected at most sites. Sampling was begun in March, 1973, and was completed in March, 1974.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the Georgia District Office of the U.S. Geological Survey for the tributary sites nearest the lake.

In this report, nutrient loads for sampled tributaries were determined by using a modification of a U.S. Geological Survey computer program for calculating stream loadings*. Nutrient loads shown are those measured minus point-source loads, if any.

Nutrient loads for unsampled "minor tributaries and immediate drainage" ("ZZ" of U.S.G.S.) were estimated using the means of the nutrient loads, in kg/km^2/year, at stations B-1, E-1 , and F-1 and multiplying the means by the ZZ area in km^2.

The operators of the Acworth, Canton, and Kennesaw wastewater treatment plants provided monthly effluent samples and corresponding flow data. Nutrient loads from the following point sources were

* See Working Paper No. 175.

estimated at 1.134 kg P and 3.401 kg N/capita/year: City of Jasper, City of Nelson, Shadowwood MHP, Oak Grove Elem. School, Bell's Ferry MHP, Woodstock Medical Clinic, Canton Nursing Home, Huntington Woods SD, Canton Road Plaza, Reinhardt College, Moore's School, Red Top Mt. State Park, Third Army Rec. Area, Allatoona Enterprises (Allatoona Landing), Haven Hill SD, Shilo Hills SD, Lincoln SD, Piedmont Hills SD, Maggie Valley SD, Allatoona Plaza, and Awtry Jr. High School.

Nutrient loads for the Iron Hill Rec. Area, Bells Ferry School, and the industrial sources shown are not known.

A. Waste Sources†:

1. Known muncipal -

Name	Pop. Served	Treatment	Mean Flow†† (m^3/d)	Receiving Water
City of Canton	4,000	act. sludge	1,044.7	Etowah River
City of Nelson	1,500	trickling filter	567.8	Sharp Mt. Creek
City of Kennesaw	6,000*	trickling filter	2,517.0	Noonday Creek
City of Acworth	2,000	act. sludge	1,173.4	Tanyard Creek
Shadowwood MHP	1,000	stab. pond	378.5	Owl Creek
Oak Grove Elem. School	200	stab. pond	75.7	Trib. to Kellogg Creek
Bell's Ferry MHP	400	act. sludge	151.4	Posey Creek/ Noonday Creek
Woodstock Medical Clinic	20	act. sludge	7.6	Rube's Creek/ Little River
Canton Nursing Home	40	act. sludge	15.1	Trib. to Etowah River
Huntington Woods SD	380	act. sludge	143.8	Trib. to Noonday Creek
Canton Road Plaza	100	act. sludge	37.8	Trib. to Noonday Creek
Bell's Ferry School	unknown	unknown	unknown	Noonday Creek
Reinhardt College	240	act. sludge	90.8	Moore's Creek/ Shoal Creek
Moore's School	70	septic tanks + sand filter	26.5	Moore's Creek/ Shoal Creek
Red Top Mt. State Park	110	sand filter	41.6	Allatoona Reservoir
Third Army Rec. Area	300	act. sludge	113.6	Allatoona Reservoir
Iron Hill Rec. Area	unknown	waste stab. pond	unknown	Allatoona Reservoir
Allatoona Enterprises (Allatoona Landing)	200	act. sludge + waste stab. pond	75.7	Allatoona Reservoir
Haven Hill SD	380	act. sludge	143.8	Trib. to Lake Acworth
Shilo Hills SD	1,000	act. sludge	378.5	Trib. to Noonday Creek
Lincoln SD	240	waste stab. pond	90.8	Noonday Creek
Piedmont Hills SD	300	waste stab. pond	113.6	Noonday Creek
Maggie Valley SD	600	waste stab. pond	227.1	Noonday Creek
Allatoona Plaza	70	act. sludge	26.5	Noonday Creek
Awtry Jr. High School	200	unknown	75.7	Proctor Creek
City of Jasper**	1,202	waste stab. pond	643.4	Polecat Creek/Sharp Mt. Cr.
		waste stab. pond	492.0	Unnamed Cr./ Sharp Mt. Cr.

† Anonymous, 1972
†† Except for Acworth, Canton, and Jasper, estimated at 0.3785 m^3/capita/day.
* Treatment plant questionnaire.
** Anonymous, 1971; flows shown are design flows.

2. Known industrial* -

Name	Type Waste	Treatment	Design Flow (m^3/day)	Receiving Water
Canton Textile Mills	dye, domestic	act. sludge**	1,438.3	Etowah River
Central Soya of Canton, Inc.	poultry processing	act. sludge + stab. pond**	2,971.2	Blanket's Creek
Coker's Hatchery and Egg Washing Plant, Canton	wash water	stab. pond	1.5	Mill Creek
Gold Kist Poultry Rendering Plant, Ball Ground	condensate, wash water	anaerobic, aerobic ponds	2,271.0	Etowah River

* Anonymous, 1972.
** Under construction.

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source	kg P/ yr	% of total
a. Tributaries (non-point load) -		
Etowah River	46,465	46.7
Shoal Creek	2,680	2.7
Little River	13,735	13.8
Noonday Creek	2,985	3.0
Allatoona Creek	1,080	1.1
Stamp Creek	535	0.5
Lake Acworth outlet	365	0.4
b. Minor tributaries & immediate drainage (non-point load) -	4,070	4.1
c. Known municipal STP's -		
City of Canton	5,180	5.2
City of Nelson	1,700	1.7
City of Kennesaw	6,745	6.8
City of Acworth	4,975	5.0
City of Jasper	1,365	1.4
Shadowwood MHP	1,135	1.1
Oak Grove Elem. School	225	0.2
Bell's Ferry MHP	455	0.5
Woodstock Medical Clinic	25	<0.1
Canton Nursing Home	45	<0.1
Huntington Woods SD	430	0.4
Canton Road Plaza	115	0.1
Bell's Ferry School	unknown	-
Reinhardt College	270	0.3
Moore's School	80	0.1
Red Top Mt. State Park	125	0.1
Third Army Rec. Area	340	0.3
Iron Hill Rec. Area	unknown	-
Allatoona Enterprises	225	0.2
Haven Hill SD	430	0.4
Shilo Hills SD	1,135	1.1
Lincoln SD	270	0.3
Piedmont Hills SD	340	0.3
Maggie Valley SD	680	0.7
Allatoona Plaza	80	0.1
Awtry Jr. High School	225	0.2
d. Septic tanks* -	60	0.1
e. Known industrial -		
Canton Textile Mills	unknown	-
Central Soya	unknown	-
Coker's Hatchery & Egg Washing Plant	unknown	-
Gold Kist Poultry Rendering Plant	unknown	-
f. Direct precipitation** -	840	0.8
Total	99,410	100.0

2. Outputs -

Lake outlet - Etowah River 35,180

3. Net annual P accumulation - 64,230 kg.

* Estimate based on 101 shoreline dwellings and 16 camping areas; see Working Paper No. 175.

** See Working Paper No. 175.

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

Source	kg N/yr	% of total
a. Tributaries (non-point load) -		
Etowah River	595,080	57.3
Shoal Creek	41,620	4.0
Little River	159,470	15.4
Noonday Creek	33,870	3.3
Allatoona Creek	17,535	1.7
Stamp Creek	8,400	0.8
Lake Acworth outlet	9,220	0.9
b. Minor tributaries & immediate drainage (non-point load) -	65,715	6.3
c. Known municipal STP's -		
City of Canton	2,110	0.2
City of Nelson	5,100	0.5
City of Kennesaw	15,245	1.5
City of Acworth	6,680	0.6
City of Jasper	4,090	0.4
Shadowwood MHP	3,400	0.3
Oak Grove Elem. School	680	<0.1
Bell's Ferry MHP	1,360	0.1
Woodstock Medical Clinic	70	<0.1
Canton Nursing Home	135	<0.1
Huntington Woods SD	1,290	0.1
Canton Road Plaza	340	<0.1
Bell's Ferry School	unknown	-
Reinhardt College	815	0.1
Moore's School	240	<0.1
Red Top Mt. State Park	375	<0.1
Third Army Rec. Area	1,020	0.1
Iron Hill Rec. Area	unknown	-
Allatoona Enterprises	680	<0.1
Haven Hill SD	1,290	0.1
Shilo Hills SD	3,400	0.3
Lincoln SD	815	0.1
Piedmont Hills SD	1,020	0.1
Maggie Valley SD	2,040	0.2
Allatoona Plaza	240	<0.1
Awtry Jr. High School	680	<0.1
d. Septic tanks* -	2,200	0.2
e. Known industrial -		
Canton Textile Mills	unknown	-
Central Soya	unknown	-
Coker's Hatchery & Egg Washing Plant	unknown	-
Gold Kist Poultry Rendering Plant	unknown	-
f. Direct precipitation** -	51,820	5.0
Total	1,038,045	100.0

2. Outputs -

Lake outlet - Etowah River 1,078,825

3. Net annual N loss - 40,780 kg.

* Estimate based on 101 shoreline dwellings and 16 camping areas; see Working Paper No. 175.
** See Working Paper No. 175.

D. Mean Annual Non-point Nutrient Export by Subdrainage Area:

Tributary	kg P/km²/yr	kg N/km²/yr
Etowah River	28	355
Shoal Creek	15	240
Little River	39	449
Noonday Creek	24	267
Allatoona Creek	15	242
Stamp Creek	11	180
Lake Acworth outlet	7	187

E. Yearly Loading Rates:

In the following table, the existing phosphorus loading rates are compared to those proposed by Vollenweider (Vollenweider and Dillon, 1974). Essentially, his "dangerous" rate is the rate at which the receiving water would become eutrophic or remain eutrophic; his "permissible" rate is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic rate would be considered one between "dangerous" and "permissible".

Note that Vollenweider's model may not be applicable to water bodies with short hydraulic retention times.

	Total Phosphorus		Total Nitrogen	
	Total	Accumulated	Total	Accumulated
grams/m^2/yr	2.07	1.34	21.6	loss*

Vollenweider loading rates for phosphorus ($g/m^2/yr$) based on mean depth and mean hydraulic retention time of Allatoona Reservoir:

"Dangerous" (eutrophic rate)	1.12
"Permissible" (oligotrophic rate)	0.56

* There was an apparent loss of nitrogen during the sampling year. This may have been due to nitrogen fixation in the lake, solubilization of previously sedimented nitrogen, recharge with nitrogen-rich ground water, unknown and unsampled point sources discharging directly to the lake, or underestimation of the nitrogen loads from point sources. Whatever the cause, a similar nitrogen loss has occurred at Shagawa Lake, Minnesota, which has been intensively studied by EPA's National Eutrophication and Lake Restoration Branch.

V. LITERATURE REVIEWED

Anonymous, 1970. Coosa River Basin Study. GA Water Qual. Contr. Bd., Atlanta.

Anonymous, 1971. Inventory of water pollution control facilities. GA Water Qual. Contr. Bd., Atlanta.

Anonymous, 1972. Georgia municipal and industrial wastewater treatment facilities associated with reservoirs. GA Dept. of Nat. Resources, Atlanta.

Anonymous, 1974. Water quality data for Georgia streams, 1973; vol. 3. GA Dept. of Nat. Resources, Atlanta.

Hall, Edward T., 1974. Personal communication (lake morphometry). GA Dept. of Nat. Resources, Atlanta.

Vollenweider, R. A., and P. J. Dillon, 1974. The application of the phosphorus loading concept to eutrophication research. Natl. Res. Council of Canada Publ. No. 13690, Canada Centre for Inland Waters, Burlington, Ontario.

VII. APPENDICES

APPENDIX A

CONVERSION FACTORS

CONVERSION FACTORS

Hectares x 2.471 = acres

Kilometers x 0.6214 = miles

Meters x 3.281 = feet

Cubic meters x 8.107×10^{-4} = acre/feet

Square kilometers x 0.3861 = square miles

Cubic meters/sec x 35.315 = cubic feet/sec

Centimeters x 0.3937 = inches

Kilograms x 2.205 = pounds

Kilograms/square kilometer x 5.711 = lbs/square mile

APPENDIX B

LAKE RANKINGS

LAKES RANKED BY INDEX NOS.

RANK	LAKE CODE	LAKE NAME	INDEX NO
1	1316	BLUE RIDGE LAKE	524
2	1318	BURTON LAKE	523
3	1303	CHATUGE LAKE	424
4	1311	NOTTELY RESERVOIR	393
5	1310	LAKE SIDNEY LANIER	385
6	1304	CLARK HILL RESERVOIR	309
7	1301	ALLATOONA RESERVOIR	286
8	1302	BLACKSHEAR LAKE	284
9	1313	SINCLAIR LAKE	254
10	1312	LAKE SEMINOLE	253
11	1319	HIGH FALLS LAKE	192
12	1314	LAKE EUFAULA	184
13	1309	JACKSON LAKE	116
14	1317	LAKE HARDING	77

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS P	INDEX NO
1301	ALLATOONA RESERVOIR	62 (8)	54 (7)	46 (6)	31 (4)	31 (0)	62 (7)	286
1302	BLACKSHEAR LAKE	38 (5)	31 (4)	0 (0)	100 (13)	100 (13)	15 (2)	284
1303	CHATUGE LAKE	85 (11)	85 (11)	92 (12)	69 (9)	31 (0)	62 (7)	424
1304	CLARK HILL RESERVOIR	54 (7)	62 (8)	62 (8)	54 (7)	31 (0)	46 (6)	309
1309	JACKSON LAKE	8 (1)	8 (1)	15 (2)	8 (1)	69 (9)	8 (1)	116
1310	LAKE SIDNEY LANIER	69 (9)	46 (6)	77 (10)	77 (10)	31 (0)	85 (10)	385
1311	NOTTELY RESERVOIR	77 (10)	69 (9)	69 (9)	62 (8)	31 (0)	85 (10)	393
1312	LAKE SEMINOLE	31 (4)	15 (2)	38 (5)	46 (6)	92 (12)	31 (4)	253
1313	SINCLAIR LAKE	46 (6)	38 (5)	54 (7)	23 (3)	31 (0)	62 (7)	254
1314	LAKE EUFAULA	15 (2)	23 (3)	31 (4)	15 (2)	77 (10)	23 (3)	184
1316	BLUE RIDGE LAKE	92 (12)	92 (12)	85 (11)	85 (11)	85 (11)	85 (10)	524
1317	LAKE HARDING	0 (0)	0 (0)	8 (1)	38 (5)	31 (0)	0 (0)	77
1318	BURTON LAKE	100 (13)	100 (13)	100 (13)	92 (12)	31 (0)	100 (13)	523
1319	HIGH FALLS LAKE	23 (3)	77 (10)	23 (3)	0 (0)	31 (0)	38 (5)	192

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS P
1301	ALLATOONA RESERVOIR	0.020	0.150	443.167	7.489	14.900	0.005
1302	BLACKSHEAR LAKE	0.035	0.250	468.091	1.855	11.700	0.014
1303	CHATUGE LAKE	0.014	0.110	382.778	6.339	14.900	0.005
1304	CLARK HILL RESERVOIR	0.024	0.150	439.250	6.715	14.900	0.007
1309	JACKSON LAKE	0.094	0.530	461.385	14.577	14.800	0.027
1310	LAKE SIDNEY LANIER	0.016	0.180	396.417	5.431	14.900	0.004
1311	NUTTELY RESERVOIR	0.015	0.130	405.667	6.656	14.900	0.004
1312	LAKE SEMINOLE	0.040	0.405	456.133	6.760	11.800	0.010
1313	SINCLAIR LAKE	0.028	0.230	440.667	8.006	14.900	0.005
1314	LAKE EUFAULA	0.048	0.345	457.667	9.083	14.400	0.011
1316	BLUE RIDGE LAKE	0.010	0.105	394.889	3.078	13.000	0.004
1317	LAKE HARDING	0.114	0.640	467.538	7.438	14.900	0.045
1318	BURTON LAKE	0.007	0.100	363.889	2.733	14.900	0.003
1319	HIGH FALLS LAKE	0.047	0.115	459.444	15.075	14.900	0.009

APPENDIX C

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR GEORGIA 1/9/75

LAKE CODE 1301 ALLATOONA LAKE

TOTAL DRAINAGE AREA OF LAKE(SQ KM) 2874.9

TRIBUTARY	SUB-DRAINAGE AREA(SQ KM)	NORMALIZED FLOWS(CMS) JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
1301A1	1675.7	42.28	53.77	68.65	56.18	48.18	29.82	27.86	21.95	17.44	17.05	19.77	29.93	34.55
1301A2	2874.9	58.89	52.05	68.05	73.34	65.92	43.89	39.22	37.60	36.11	39.64	46.07	55.16	50.58
1301B1	173.5	3.17	4.45	4.70	3.88	2.63	1.84	1.98	1.27	1.88	1.30	1.81	2.88	2.56
1301C1	354.8	6.23	8.78	9.26	7.65	5.21	3.62	3.74	2.49	2.10	2.58	3.68	5.52	5.04
1301D1	126.9	2.15	3.03	3.20	2.66	1.81	1.25	1.30	0.85	0.95	0.91	1.25	1.90	1.75
1301E1	72.5	1.30	1.70	1.90	1.59	0.96	0.68	0.74	0.51	0.40	0.45	0.65	1.02	0.99
1301F1	46.6	0.85	1.10	1.19	0.99	0.68	0.48	0.48	0.34	0.28	0.34	0.48	0.71	0.66
1301G1	49.2	0.88	1.13	1.22	1.02	0.71	0.48	0.48	0.37	0.28	0.34	0.51	0.74	0.68
1301ZZ	297.8	5.55	7.22	8.81	6.63	4.88	2.92	3.11	2.15	1.84	1.87	2.78	4.36	4.18

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 2874.9
SUM OF SUB-DRAINAGE AREAS = 2797.2

TOTAL FLOW IN = 606.93
TOTAL FLOW OUT = 606.94

NOTE *** LAKE AREA=77.7 SQ KM. NOT INCLUDED IN SUM OF SUB-DRAINAGE AREAS

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
1301A1	3	73	78.72	11	58.62				
	4	73	92.31	14	61.45				
	5	73	87.50	13	68.53				
	6	73	65.70	3	64.26				
	7	73	38.51	3	41.63				
	8	73	30.87	5	26.25				
	9	73	27.41	9	18.07				
	10	73	22.31	9	22.14				
	11	73	27.72	11	18.46				
	12	73	47.29	12	32.28				
	1	74	86.65	6	73.86				
	2	74	76.46	2	63.43	3	74.19		
	3	74	0.0	3	58.90				
1301A2	3	73	73.34	11	8.61				
	4	73	118.36	14	140.73				
	5	73	117.51	13	54.37				
	6	73	137.34	3	118.93				
	7	73	59.18	3	100.24				
	8	73	47.01	5	7.73				
	9	73	36.25	9	30.30				
	10	73	58.90	9	71.64				
	11	73	62.86	11	13.37				
	12	73	73.34	12	137.62				
	1	74	137.05	6	57.20				
	2	74	98.54	2	148.10	3	54.37		
	3	74	0.0	3	8.30				

TRIBUTARY FLOW INFORMATION FOR GEORGIA 1/9/75

LAKE CODE 1301 ALLATOONA LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
1301A1	3	73	7.58	11	5.21				
	4	73	6.74	14	4.02				
	5	73	5.27	13	4.22				
	6	73	3.23	3	3.20				
	7	73	2.24	3	2.18				
	8	73	1.59	5	1.56				
	9	73	1.36	9	0.82				
	10	73	1.25	9	1.22				
	11	73	1.44	11	1.10				
	12	73	2.97	12	1.39				
	1	74	6.94	6	8.35				
	2	74	4.33	2	3.17	3	3.20		
	3	74	0.0	3	2.69				
1301C1	3	73	13.88	11	10.25				
	4	73	13.17	8	28.60				
	5	73	10.36	5	6.54				
	6	73	6.34	2	7.16				
	7	73	4.42	8	5.46				
	8	73	3.14	4	3.09				
	9	73	2.60	8	1.67				
	10	73	2.46	13	2.14				
	11	73	2.83	1	2.21				
	12	73	5.86	1	2.79				
	1	74	13.65	5	17.90	19	4.76		
	2	74	8.52	2	6.23	16	26.05		
1301D1	3	73	4.53	11	3.40				
	4	73	4.25	8	8.35				
	5	73	3.90	5	2.32				
	6	73	2.27	2	2.49				
	7	73	1.64	8	2.10				
	8	73	1.22	4	1.19				
	9	73	1.05	9	0.68				
	10	73	0.99	13	0.85				
	11	73	1.08	3	0.91				
	12	73	2.10	1	1.04				
	1	74	4.39	5	5.66	19	1.73		
	2	74	2.92	2	2.21	16	7.93		
1301E1	3	73	3.11	11	2.12				
	4	73	2.97	8	7.08				
	5	73	2.09	5	1.25				
	6	73	1.22	2	1.39				
	7	73	0.82	8	1.19				
	8	73	0.54	4	0.51				
	9	73	0.42	8	0.35				
	10	73	0.46	13	0.34				
	11	73	0.48	3	0.37				
	12	73	1.10	1	0.65				
	1	74	3.11	5	3.96	19	0.88		
	2	74	1.73	2	1.27	16	6.51		

TRIBUTARY FLOW INFORMATION FOR GEORGIA 1/9/75

LAKE CODE 1301 ALLATOONA LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
1301F1	3	73	1.93	11	1.36				
	4	73	1.81	14	1.02				
	5	73	1.36	13	1.10				
	6	73	0.92	3	0.82				
	7	73	0.57	3	0.54				
	8	73	0.40	5	0.37				
	9	73	0.31	9	0.20				
	10	73	0.31	9	0.28				
	11	73	0.34	3	0.28				
	12	73	0.76	1	0.34				
	1	74	1.47	5	2.49	19	0.59		
	2	74	1.13	2	0.82				
	3	74	0.0	3	0.68				
1301G1	3	73	1.78	11	1.36				
	4	73	1.70	8	3.40				
	5	73	1.36	5	0.91				
	6	73	0.88	2	0.99				
	7	73	0.65	8	0.82				
	8	73	0.48	4	0.45				
	9	73	0.40	8	0.25				
	10	73	0.37	13	0.34				
	11	73	0.42	3	0.34				
	12	73	0.82	1	0.42				
	1	74	1.70	5	2.27	19	0.68		
	2	74	1.16	2	0.88	16	3.40		
1301Z7	1	73	2.69						
	2	73	1.67						
	3	73	2.75						
	4	73	2.61						
	5	73	2.04						
	6	73	1.25						
	7	73	0.88						
	8	73	0.62						
	9	73	0.54						
	10	73	0.48						
	11	73	0.57						
	12	73	1.16						

APPENDIX D

PHYSICAL and CHEMICAL DATA

STORET RETRIEVAL DATE 74/11/26

130101
34 09 54.0 084 43 33.0
ALLATOONA RESERVOIR
13015 GEORGIA

11EPALES
3

2111202
0128 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/07/01	10 15	0000	28.0		71	50K	7.10	18	0.100	0.800	0.060	0.005
	10 15	0007	26.5	6.5		50K	7.00	18	0.070	0.500	0.070	0.003
	10 15	0012	24.3	5.7		50K	6.80	19	0.080	0.200	0.110	0.002
	10 15	0015	24.2	5.6		50K	6.80	14	0.080	0.300	0.120	0.002K
	10 15	0050	22.1	4.0		50K	6.50	18	0.080	0.300	0.130	0.006
	10 15	0090	20.8	2.2		50K	6.50	16	0.140	0.200	0.150	0.003
	10 15	0125	20.2	1.1		50K	6.60	15	0.150	0.300	0.180	0.004
73/09/17	09 50	0000	27.0	6.8	82	37	7.20	16	0.070	1.400	0.040	0.012
	09 50	0020	26.9	6.4		39	6.90	16	0.040	0.400	0.020	0.006
	09 50	0035	25.2	0.2		39	6.50	17	0.050	0.200	0.040	0.005
	09 50	0055	24.4	0.2		39	6.30	16	0.070	0.300	0.090	0.004
	09 50	0075	23.6	0.2		46	6.10	18	0.190	0.400	0.020	0.006
	09 50	0095	23.3	0.2		44	6.10	17	0.190	0.500	0.020	0.004
	09 50	0115	23.1	0.2		54	6.20	17	0.370	0.600	0.030	0.003
	09 50	0131	22.3	0.2		82	6.50	21	0.840	1.200	0.020	0.004
73/11/12	15 57	0000	16.7		43	34	6.50	17	0.080	0.200K	0.060	0.014
	15 57	0005	16.7	7.2		34	6.50	16	0.080	0.200K	0.060	0.011
	15 57	0015	16.7	7.4		33	6.50	16	0.080	0.200K	0.060	0.012
	15 57	0040	16.7	7.0		34	6.50	16	0.080	0.200K	0.060	0.016
	15 57	0075	16.3	6.6		33	6.60	17	0.090	0.200K	0.060	0.013
	15 57	0110	15.6	6.2		35	6.60	17	0.120	0.200K	0.070	0.016

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

130101
34 09 54.0 084 43 33.0
ALLATOONA RESERVOIR
13015 GEORGIA

11EPALES 2111202
3 0128 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/07/01	10 15	0000	0.017	4.6
	10 15	0007	0.016	
	10 15	0012	0.015	
	10 15	0015	0.015	
	10 15	0050	0.013	
	10 15	0090	0.018	
	10 15	0125	0.023	
73/09/17	09 50	0000	0.021	4.6
	09 50	0020	0.010	
	09 50	0035	0.008	
	09 50	0055	0.009	
	09 50	0075	0.013	
	09 50	0095	0.014	
	09 50	0115	0.015	
	09 50	0131	0.017	
73/11/1?	15 57	0000	0.020	3.8
	15 57	0005	0.018	
	15 57	0015	0.018	
	15 57	0040	0.020	
	15 57	0075	0.025	
	15 57	0110	0.034	

STORET RETRIEVAL DATE 74/11/26

130102
34 06 47.0 084 42 58.0
ALLATOONA RESERVOIR
13015 GEORGIA

11EPALES
3

2111202
0059 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/06/30	14 40	0000	28.2		54	50K	8.70	14	0.140	1.100	0.090	0.005
	14 40	0007	27.7	8.6		50K	8.40	13	0.100	0.700	0.090	0.004
	14 40	0015	24.0	4.5		50K	5.80	12	0.110	0.300	0.130	0.003
	14 40	0030	22.4	3.6		50K	5.70	11	0.130	0.300	0.120	0.002
	14 40	0055	21.2	1.3		50K	5.80	21	0.190	0.500	0.110	0.004
73/09/17	11 00	0000	27.1	6.6	72	41	6.50	17	0.080	1.400	0.040	0.007
	11 00	0015	27.0	5.8		40	6.30	14	0.040	0.600	0.020	0.005
	11 00	0030	25.5	0.2		40	6.20	15	0.090	0.500	0.020K	0.004
	11 00	0040	24.7	0.1		44	6.10	16	0.160	0.600	0.020	0.004
	11 00	0052	24.2	0.0		53	6.20	20	0.370	1.000	0.030	0.005
73/11/12	15 35	0000	16.5		41	36	6.90	20	0.080	0.300	0.050	0.011
	15 35	0005	16.3	8.0		36	6.70	21	0.100	0.300	0.050	0.013
	15 35	0015	16.2	7.8		36	6.60	20	0.090	0.200K	0.050	0.012
	15 35	0030	16.2	8.0		36	6.60	19	0.100	0.200	0.050	0.011
	15 35	0040	15.6	8.0		36	6.60	19	0.090	0.200K	0.050	0.011

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/06/30	14 40	0000	0.020	11.2
	14 40	0007	0.028	
	14 40	0015	0.017	
	14 40	0030	0.013	
	14 40	0055	0.021	
73/09/17	11 00	0000	0.014	6.3
	11 00	0015	0.011	
	11 00	0030	0.011	
	11 00	0040	0.010	
	11 00	0052	0.014	
73/11/12	15 35	0000	0.025	6.5
	15 35	0005	0.026	
	15 35	0015	0.022	
	15 35	0030	0.030	
	15 35	0040	0.030	

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

130103
34 06 47.0 084 42 14.0
ALLATOONA RESERVOIR
13067 GEORGIA

11EPALES
3

2111202
0019 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/06/30	15 30	0000	28.6		60	50K	7.60	19	0.120	1.100	0.090	0.003
	15 30	0005	28.3	7.0		50K	7.10	20	0.080	0.500	0.070	0.002
	15 30	0010	27.2	2.2		50K	6.60	22	0.090	0.500	0.080	0.002
	15 30	0015	24.6	0.5		50K	6.60	27	0.120	0.500	0.100	0.004
73/09/17	11 40	0000	27.1	6.4	54	49	6.50	19	0.040	0.700	0.020	0.005
	11 40	0011	27.0	6.0		49	6.50	19	0.040	0.700	0.020	0.004
73/11/12	15 20	0000	11.5		34	38	6.80	21	0.050	0.400	0.060	0.013
	15 20	0001	11.5	10.0		38						
	15 20	0005	11.0	9.2		38	6.80	20	0.040	0.300	0.050	0.012

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/06/30	15 30	0000	0.020	6.1
	15 30	0005	0.017	
	15 30	0010	0.025	
	15 30	0015	0.029	
73/09/17	11 40	0000	0.014	10.1
	11 40	0011	0.014	
73/11/12	15 20	0000	0.033	6.4
	15 20	0005	0.031	

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

130104
34 07 48.0 084 37 42.0
ALLATOONA RESERVOIR
13 GEORGIA

11EPALES 2111202
3 0045 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/07/01	11 30	0000	28.3		79	50K	8.20	14	0.070	0.800	0.060	0.004
	11 30	0010	27.4	6.3		50K	7.60	13	0.050	0.300	0.060	0.004
	11 30	0016	23.8	6.2		50K	6.80	11	0.060	0.200	0.100	0.003
	11 30	0025	22.8	3.8		50K	6.60	11	0.070	0.200K	0.180	0.002
	11 30	0042	22.1	3.1		50K	6.60	12	0.110	0.200K	0.190	0.002
73/09/17	13 50	0000	26.9	7.2	72	41	6.70	17	0.050	0.800	0.020	0.006
	13 50	0015	26.6	4.0		40	6.40	17	0.040	0.600	0.020	0.005
	13 50	0030	24.9	0.4		42	6.10	19	0.090	0.500	0.050	0.004
	13 50	0043	24.2	2.4		46	6.30	18	0.160	0.800	0.050	0.004
73/11/14	09 00	0000	15.4		49	31	6.80	19	0.070	0.300	0.100	0.003
	09 00	0005	15.2	8.4		31	6.70	19	0.070	0.200	0.080	0.002
	09 00	0015	15.0	8.4		31	6.70	19	0.060	0.200	0.080	0.003
	09 00	0025	14.7	8.4		31	6.70	18	0.060	0.200K	0.040	0.005
	09 00	0035	14.3	8.2		31	6.80	19	0.060	0.200	0.040	0.007

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/07/01	11 30	0000	0.014	9.9
	11 30	0010	0.012	
	11 30	0016	0.018	
	11 30	0025	0.023	
	11 30	0042	0.029	
73/09/17	13 50	0000	0.011	6.7
	13 50	0015	0.011	
	13 50	0030	0.013	
	13 50	0043	0.021	
73/11/14	09 00	0000	0.018	20.8
	09 00	0005	0.020	
	09 00	0015	0.019	
	09 00	0025	0.020	
	09 00	0035	0.029	

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

130105
34 09 39.0 084 34 49.0
ALLATOONA RESERVOIR
13057 GEORGIA

11EPALES
3

2111202
0023 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/07/01	13	20 0000	29.1									
	13	20 0007	27.7	7.8	54	55	7.70	16	0.080	0.300	0.080	0.003
	13	20 0015	24.7	3.2		53	7.50	16	0.070	0.300	0.100	0.003
	13	20 0020	24.0	2.7		63	6.70	19	0.160	0.200	0.340	0.004
73/09/17	14	25 0000	26.8	7.8		63	6.80	22	0.240	0.300	0.300	0.004
	14	25 0010	26.7	7.6	42	51	7.00	19	0.040	0.800	0.020	0.006
	14	25 0017	24.6	3.6		51	6.90	18	0.040	0.800	0.020	0.007
	14	25 0024	24.2	2.0		56	6.40	18	0.110	0.800	0.230	0.007
73/11/14	09	40 0000	12.3			58	6.30	18	0.190	1.000	0.270	0.010
	09	40 0006	10.6	9.6	48	39	7.00	27	0.040	0.500	0.110	0.005
	09	40 0012	9.6	9.8		44	6.90	28	0.050	0.300	0.230	0.014
						45	6.80	30	0.090	0.300	0.340	0.018

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/07/01	13	20 0000	0.020	4.0
	13	20 0007	0.028	
	13	20 0015	0.051	
	13	20 0020	0.084	
73/09/17	14	25 0000	0.019	13.5
	14	25 0010	0.025	
	14	25 0017	0.049	
	14	25 0024	0.086	
73/11/14	09	40 0000	0.045	3.4
	09	40 0006	0.056	
	09	40 0012	0.090	

STORET RETRIEVAL DATE 74/11/26

130106
34 10 52.0 084 35 15.0
ALLATOONA RESERVOIR
13057 GEORGIA

11EPALES 2111202
3 0030 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/07/01	13 50	0000	28.5		72	50K	8.40	13	0.070	0.300	0.060	0.003
	13 50	0005	28.0	8.4		50K	7.60	13	0.060	0.200K	0.050	0.002
	13 50	0010	26.8	8.2		50K	7.50	14	0.060	0.200K	0.070	0.006
	13 50	0015	24.3	6.2		50K	6.80	12	0.080	0.200K	0.140	0.003
	13 50	0027	22.5	5.4		50K	6.80	11	0.110	0.200K	0.190	0.003
73/09/17	15 00	0000	26.5	8.0	48	42	7.40	15	0.050	1.200	0.030	0.007
	15 00	0015	25.5	5.6		39	6.60	14	0.050	0.800	0.070	0.006
	15 00	0025	21.8	5.2		32	6.20	10K	0.120	0.800	0.240	0.008
	15 00	0038	21.4	4.0		34	6.20	11	0.140	1.100	0.250	0.008
73/11/14	08 30	0000	12.6		48	33	7.00	23	0.090	0.300	0.100	0.004
	08 30	0008	12.3	9.2		30	6.50	20	0.050	0.300	0.060	0.006
	08 30	0013	11.1	8.6		26	6.80	19	0.050	0.200K	0.060	0.009

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/07/01	13 50	0000	0.017	4.7
	13 50	0005	0.022	
	13 50	0010	0.021	
	13 50	0015	0.021	
	13 50	0027	0.061	
73/09/17	15 00	0000	0.027	9.3
	15 00	0015	0.028	
	15 00	0025	0.076	
	15 00	0038	0.096	
73/11/14	08 30	0000	0.032	2.9
	08 30	0008	0.027	
	08 30	0013	0.029	

K VALUE KNOWN TO BE
LESS THAN INDICATED

APPENDIX E

TRIBUTARY and WASTEWATER TREATMENT PLANT DATA

STORET RETRIEVAL DATE 74/12/04

13014I 13014I
34 13 30.0 084 30 00.0
ETOWA RIVER
13001 7.5 S CANTON
I/ALLATOONA LAKE
BANK 200 YDS ABOV HWY 5 BRDG
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/11	17 50		0.210	0.790	0.176	0.027	0.130
73/04/14	14 50		0.150	0.670	0.060	0.011	0.040
73/05/13	12 35		0.154	0.340	0.018	0.009	0.050
73/06/03	14 56		0.147	0.350	0.056	0.006	0.035
73/07/03	18 35		0.140	0.250	0.013	0.009	0.030
73/08/05	13 00		0.198	0.490	0.120	0.005K	0.035
73/09/09	14 30		0.147	0.400	0.115	0.008	0.030
73/10/09	11 30		0.370	0.200	0.035	0.009	0.025
73/11/11	12 15		0.074	0.200	0.029	0.010	0.015
73/12/12	11 45		0.148	0.300	0.020	0.020	0.055
74/01/06	11 45		0.330	0.300	0.025	0.010	0.065
74/02/02	14 10		0.504	0.400	0.020	0.012	0.120
74/02/03	11 45		0.168	0.200	0.010	0.010	0.050
74/03/03	12 30		0.208	0.400	0.055	0.010	0.030

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 74/12/04

1301A2 1301A2
34 10 00.0 084 44 30.0
ETOWA RIVER
13 7.5 ALLATOONA DA
0/ALLATOONA LAKE
BELO ALLATOONA DAM AT GAGING STATION
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/11	15 10		0.252	2.800	1.180	0.012	0.030
73/04/14	14 45		0.210	0.750	0.082	0.012	0.045
73/05/13	10 30		0.180	0.150	0.036	0.011	0.030
73/06/03	13 00		0.130	0.370	0.058	0.006	0.015
73/07/03	11 40		0.110	0.250	0.044	0.006	0.020
73/08/05	11 30		0.115	0.120	0.050	0.005K	0.015
73/09/09	12 30		0.126	0.310	0.050	0.005K	0.020
73/10/09	08 55		0.084	1.050	0.100	0.006	0.010
73/11/11	10 00		0.056	0.500	0.038	0.005K	0.005K
73/12/12	10 50		0.068	0.100	0.012	0.008	0.010
74/01/06	09 50		0.252	0.600	0.055	0.005	0.030
74/02/02	12 45		0.250	0.200	0.020	0.010	0.035
74/02/03	09 40		0.260	0.200	0.095	0.015	0.040
74/03/03	13 00		0.200	0.200	0.020	0.015	0.025

K VALUE KNOWN TO BE LESS
THAN INDICATED

STORET RETRIEVAL DATE 74/12/04

130181 130181
34 14 30.0 084 33 30.0
SHOAL CREEK
13 7.5 S CANTON
T/ALLATOONA LAKE
BRDG ON MT CARMEL RD 4 MI ENE SUTALLEE
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/11	17 00		0.097	1.540	0.399	0.009	0.095
73/04/14	16 10		0.076	0.540	0.140	0.005K	0.025
73/05/13	11 55		0.062	0.140	0.007	0.006	0.030
73/06/03	14 20		0.096	1.200	0.410	0.006	0.020
73/07/03	17 50		0.072	0.110	0.018	0.007	0.030
73/08/05	12 10		0.078	0.750	0.132	0.005K	0.045
73/09/09	13 30		0.054	0.400	0.070	0.009	0.035
73/10/09	10 00		0.011	0.100K	0.020	0.011	0.015
73/11/11	11 00		0.010K	0.150	0.015	0.007	0.015
73/12/12	11 05		0.080	0.100	0.005	0.012	0.070
74/01/06	11 00		0.132	0.350	0.020	0.005	0.035
74/02/02	12 45		0.160	0.400	0.025	0.010	0.045
74/02/03	11 15		0.112	0.100K	0.010	0.010	0.030
74/03/03	13 15		0.096	0.200	0.010	0.010	0.015

K VALUE KNOWN TO BE LESS
THAN INDICATED

STORET RETRIEVAL DATE 74/12/04

1301C1 1301C1
34 07 30.0 084 30 30.0
LITTLE RIVER
13 7.5 KENNESAW
ALLATOONA LAKE
BRDG ON RT 5 NE OF WOODSTOCK
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/11	09 45		0.300	1.380	0.063	0.00P	0.055
73/04/09	09 40		0.270	1.320	0.120	0.026	0.125
73/05/05	09 55		0.260	0.380	0.105		0.045
73/06/02	14 05		0.294	0.315	0.017	0.011	0.055
73/07/08	09 39		0.840	0.690	0.050	0.019	0.150
73/08/04	10 04		0.320	0.260	0.009	0.006	0.055
73/09/08	10 30		0.317	0.300	0.780	0.011	0.055
73/10/13	09 20		0.231	0.275	0.012	0.007	0.042
73/11/03	09 09		0.336	0.250	0.046		0.020
73/12/01	14 20		0.240	0.200	0.044	0.005K	0.070
74/01/05	13 55		0.460	0.600	0.045	0.030	0.155
74/01/19	09 04		0.410	0.100	0.020	0.010	0.055
74/02/02	09 31		0.350	0.200	0.015	0.005	0.045
74/02/16	09 06		0.336	1.400	0.030	0.025	0.310

K VALUE KNOWN TO BE LESS
THAN INDICATED

STORET RETRIEVAL DATE 74/12/04

130101 130101
34 06 30.0 084 33 00.0
NOONDAY CREEK
13 7.5 KENNESAW
T/ALLATOONA LAKE
BRDG ON SECONDARY RD W OF WOODSTOCK
11EPALFS 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/11	10	14	0.480	0.890	0.076	0.110	0.450
73/04/08	09	57	0.260	1.680	0.294	0.042	0.172
73/05/05	10	12	0.370	0.350	0.066		0.137
73/06/02	14	23	0.399	1.000	0.200	0.054	0.120
73/07/08	09	53	0.450	0.440	0.040	0.082	0.240
73/08/04	10	20	0.620	0.330	0.046	0.160	0.250
73/09/09	10	45	0.860	0.360	0.075	0.290	0.345
73/10/13	09	43	0.630	0.250	0.039	0.126	0.190
73/11/03	09	25	0.790	0.500	0.160		0.345
73/12/01	14	36	0.588	0.300	0.060		0.200
74/01/05	14	16	0.430	0.400	0.040	0.035	0.125
74/01/19	10	22	0.704	0.100	0.050	0.075	0.175
74/02/02	09	54	0.570	0.200	0.020	0.045	0.120
74/02/16	09	25	0.264	1.200	0.030	0.030	0.550

STORET RETRIEVAL DATE 74/12/04

1301E1 1301E1
34 02 00.0 084 43 00.0
ALLATOONA CREEK
13 7.5 ACWORTH
T/ALLATOONA LAKE
BANK 300 YRDS FROM END OF HILL RD
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/11	11 35		0.075	0.600	0.033	0.014	0.015
73/04/08	11 25		0.098	0.890	0.231	0.020	0.075
73/05/05	11 20		0.011	0.960	0.064		0.080
73/07/08	11 45		0.056	0.400	0.016	0.008	0.035
73/08/04	11 35		0.015	0.320	0.018	0.009	0.030
73/09/08	12 15		0.046	0.390	0.042	0.007	0.035
73/10/13	11 25		0.038	0.800	0.044	0.010	0.020
73/11/03	10 52		0.054	0.500	0.046		0.015
73/12/01	15 40		0.044	0.100	0.016	0.005K	0.055
74/01/05	15 50		0.139	0.200	0.025	0.007	0.030
74/01/19	08 40		0.198	0.100K	0.020	0.010	0.020
74/02/02	10 59		0.120	0.100K	0.015	0.005K	0.010
74/02/16	09 00		0.044	1.200	0.035	0.030	

K VALUE KNOWN TO BE LESS
THAN INDICATED

STORET RETRIEVAL DATE 74/12/04

1301F1 1301F1
34 13 00.0 084 41 00.0
STAMP CREEK
13 7.5 ALLATOONA DA
T/ALLATOONA LAKE
RT 20 BRDG .6 MI E JCT WITH STAMP CK RD
11EPALES 2111204
4 0090 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/11	15	45	0.023	0.860	0.048	0.308	0.095
73/04/14	15	40	0.029	0.830	0.126	0.005K	0.015
73/05/13	11	15	0.010K	0.100K	0.007	0.006	0.010
73/06/03	13	55	0.012	0.100K	0.013	0.005K	0.007
73/07/03	17	10	0.014	0.440	0.015	0.007	0.015
73/08/05	11	35	0.011	1.200	0.038	0.005K	0.020
73/09/08	13	00	0.012	0.490	0.012	0.007	0.025
73/10/09	09	20	0.010K	0.200	0.018	0.012	0.035
73/11/03	10	30	0.022	0.150	0.018		0.025
73/12/01	10	15	0.012	0.150K	0.012	0.005K	0.050
74/01/05	10	20	0.020	0.100	0.015	0.005K	0.010
74/01/19	10	00	0.016	0.100K	0.010	0.005	0.005
74/03/03	13	00	0.008	0.300	0.005K	0.005	0.005

K VALUE KNOWN TO BE LESS
THAN INDICATED

STORET RETRIEVAL DATE 74/12/04

1301G1 1301G1
34 03 30.0 094 41 30.0
LAKE ACWORTH OUTLET
13 7.5 ACWORTH
T/ALLATOONA LAKE
BRDG ON RT 92 AT SW EDGE OF ACWORTH
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/03/11	10 58		0.160	0.380	0.034	0.010	0.035
73/04/08	10 43		0.150	1.000	0.120	0.035	0.105
73/05/05	10 52		0.130	0.770	0.130		0.050
73/06/02	15 15		0.140	0.440	0.038	0.017	0.045
73/07/08	10 45		0.021	0.230	0.013	0.005K	0.015
73/09/04	10 55		0.010K	0.320	0.011	0.005K	0.025
73/09/09	11 28		0.010K	0.340	0.018	0.005K	0.025
73/10/13	10 50		0.011	0.350	0.021	0.008	0.025
73/11/03	10 26		0.070	0.400	0.097		0.030
73/12/01	15 15		0.100	0.300	0.049	0.035K	0.050
74/01/05	15 09		0.148	0.600	0.055	0.020	0.120
74/01/19	09 00		0.192	0.200	0.065	0.020	0.060
74/02/02	10 35		0.184	0.400	0.035	0.010	0.045
74/02/16	08 35		0.160	0.300	0.035	0.015	0.050

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/01/06

1301AA AS1301AA P0048000
34 13 40.0 084 29 40.0
CANTON
13001 7.5 CANTON
T/LAKE ALLATOONA
ETOWA RIVER
11EPALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/04/11	08	00							
CP(T)-			6.300	1.200	0.280	10.900	11.500	0.219	0.328
73/04/11	15	00							
73/05/14	08	00							
CP(T)-			4.500	1.450	0.440	10.400	11.000	0.313	0.355
73/05/14	15	00							
73/06/11	08	00							
CP(T)-			3.300	2.050	0.810	11.480	11.890	0.291	0.347
73/06/11	15	00							
73/07/12	08	00							
CP(T)-			0.160	3.700	1.900	15.400	16.000	0.249	0.281
73/07/12	15	00							
73/09/20	08	00							
CP(T)-			0.017	4.650	2.700	15.550	16.000	0.247	0.208
73/09/20	15	00							
73/10/11	08	00							
CP(T)-			0.270	2.900	1.050	15.550	15.820	0.349	0.254
73/10/11	15	00							
73/11/12	08	00							
CP(T)-			5.300	3.300	1.650	17.550	18.100	0.234	0.264
73/11/12	15	00							
73/12/12	08	00							
CP(T)-			9.200	2.200	0.270	13.200	13.500	0.174	0.214
73/12/12	15	00							
74/02/18	08	00							
CP(T)-			3.680	2.000	0.260	7.400	7.750	0.239	0.253
74/02/18	15	00							
74/03/18	08	00							
CP(T)-			1.400	2.700	0.410	12.000	13.000	0.240	0.304
74/03/18	15	00							
74/04/17	08	00							
CP(T)-			2.000	2.000	1.300	9.900	10.500	0.265	0.261
74/04/17	15	00							
74/05/15	08	00							
CP(T)-			0.120	7.000	3.000	14.500	15.000	0.265	0.257
74/05/15	15	00							

STORET RETRIEVAL DATE 75/01/06

13014A AS1301AA P004000
34 13 40.0 084 29 40.0
CANTON
13001 7.5 CANTON
T/LAKE ALLATOONA
ETOWA RIVER
11EPALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
74/06/25	08 00		0.520	2.500	0.130	14.000	16.800	0.210	0.263
CP(T)-									
74/06/25	15 00								

STORET RETRIEVAL DATE 75/01/06

1301DA TF1301DA P006000
34 01 30.0 084 35 30.0
KENNESAW
13 7.5 KENNESAW
T/ALLATOONA LAKE
NOONDAY CREEK
11EPALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/05/02	11 00								
CP(T)-			0.525	15.400	5.800	3.400	5.700	0.880	
73/05/02	16 00								
73/06/12	11 00								
CP(T)-			0.033	2.730	1.100	1.040	7.600	0.707	
73/06/12	16 00								
73/07/15	11 00								
CP(T)-			0.260	17.600	5.900	3.700	8.500	0.660	
73/07/15	16 00								
73/08/07	11 00								
CP(T)-			0.110	22.000	4.500	4.200	14.650	0.612	
73/08/07	16 00								
73/09/07	11 00								
CP(T)-			0.357	21.000		7.340	10.100	0.350	
73/09/07	16 00								
73/10/08	11 00								
CP(T)-			2.100	11.500	7.700	4.500	5.800	0.552	
73/10/08	16 00								
73/11/02	11 00								
CP(T)-			0.780	22.000	9.100	5.000	7.700	0.480	
73/11/02	16 00								
73/12/06	11 00								
CP(T)-			0.210	19.500	7.600	3.300	6.250	0.560	
73/12/06	16 00								
74/01/03	11 00								
CP(T)-			0.600	11.000	3.300	2.160	3.700	0.888	
74/01/03	16 00								
74/02/14	11 00								
CP(T)-			0.440	16.000	5.450	3.150	6.700	0.875	
74/02/14	16 00								
74/03/10	11 00								
CP(T)-			0.760	19.000	8.700	3.600	5.900	0.690	
74/03/10	16 00								
74/04/10	11 00								
CP(T)-			0.840	13.500	6.650	3.250	6.100	0.689	
74/04/10	16 00								

STORET RETRIEVAL DATE 75/01/06

1301DA TF1301DA P006000
34 01 30.0 084 35 30.0
KENNESAW
13 7.5 KENNESAW
T/ALLATOONA LAKE
NOONDAY CREEK
11EPALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
74/05/09	11 00								
CP(T)-			1.360	16.000	7.900	2.800	5.400	0.700	
74/05/09	16 00								

.05'

STORET RETRIEVAL DATE 75/01/06

130121 AS130121 P002000
34 04 30.0 084 41 00.0
ACWORTH
13057 7.5 ACWORTH
T/ALLATOONA LAKE
TANYARD CREEK
11EPALES
4 2141204
0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/06/22	11 00								
CP(T)-									
73/06/22	16 00		4.600	8.600	4.000	11.000	11.800	0.330	0.345
73/08/01	10 00								
CP(T)-									
73/08/01	16 00		1.980	8.200	2.500	7.600	9.800	0.290	0.275
73/08/28	10 00								
CP(T)-									
73/08/28	16 00			12.000	3.140	12.200	13.500	0.271	0.282
73/09/21	10 00								
CP(T)-									
73/09/21	16 00		1.390	9.900	0.915	11.940	13.600	0.274	0.289
73/10/17	10 00								
CP(T)-									
73/10/17	16 00		0.075	18.000	7.200	8.500	9.500	0.287	0.291
73/11/14	10 00								
CP(T)-									
73/11/14	16 00		0.150	14.800	4.400	15.800	18.800	0.273	0.267
73/12/13	10 00								
CP(T)-									
73/12/13	16 00		4.400	12.000	3.700	13.700	14.450	0.268	0.292
74/01/21	10 00								
CP(T)-									
74/01/21	16 00		2.160	17.300	3.000	7.400	9.300	0.420	0.297
74/02/21	10 00								
CP(T)-									
74/02/21	16 00		0.200	12.000	6.800	9.700	10.500	0.353	0.384
74/03/19	10 00								
CP(T)-									
74/03/19	16 00		0.280	18.000	9.200	6.800	8.500	0.281	0.330
74/04/29	10 00								
CP(T)-									
74/04/29	16 00		5.100	16.000	7.200	10.500	12.500	0.299	0.327
74/05/29	10 00								
CP(T)-									
74/05/29	16 00		0.120	14.000	5.100	8.400	9.200	0.302	0.339